

People & Places

Phosphorus recycler on tour

Joe Harrison develops mobile device that makes fertilizer from cattle manure

By DON JENKINS
Capital Press

PUYALLUP, Wash. — Research scientist Joe Harrison began his career as a livestock nutritionist.

As time went on, environmental issues became more prominent. That caused Harrison to shift his attention rearward.

“What I tell people is I work on both ends of the cow. And that seems to be the best way for them to understand,” he said.

Harrison, 60, has been stationed at Washington State University’s Puyallup research center since 1984. He’s currently engaged in a project to recycle phosphorous, a mineral that goes in one end of the cow and out the other.

Animals and plants can’t live without it. Without phosphorous, we’d be toothless and boneless.

For growing food, there is no substitute. About 95 percent of the phosphorous mined from phosphate rock is used for commercial fertilizer, according to the Sustainable Phosphorous Alliance at Arizona State University.

Yet, too much phosphorous causes problems. It can build up in the soil. It’s not a threat to groundwater, but



Don Jenkins/Capital Press

Joe Harrison, a scientist at the Washington State University Puyallup research center since 1984, has developed a mobile device that extracts phosphorus from cow manure to make a fertilizer called struvite.

washes into rivers and lakes and can cause harmful algal blooms.

Nitrates and fecal coliform get the attention, but “we know eventually phosphorous will be an issue,” said Ginny Prest, manager of the Washington State Department of Agriculture’s dairy nutrient management program. “It’s on our radar.”

Harrison’s research project seeks to redistribute phosphorous from farms with too much to farms with too little.

The plan is to extract phosphorous from manure to make struvite, a fertilizer named for a German geologist, Heinrich Christian Gottfried von Struve. He identified the substance clogging Hamburg sewer lines in 1845 as a mixture of phosphorous, magnesium and ammonia.

Harrison recently received a \$460,000 grant from the Natural Resources Conservation Service and \$150,000 from the Washington Dairy Products Commission to build a portable struvite-maker.

He hopes that by March he will be able to haul it on a 24-foot trailer to dairies around Washington state.

Liquid manure will be pumped into the base of an upright cone, where manure and chemicals will swirl, forming struvite at the bottom. The liquid will run out the top and back into the lagoon.

“Joe Harrison’s idea of taking a mobile struvite unit around really does hold a lot of promise to manage what could be this potential phosphorous loading in the soil,” Prest said.

A thousand gallons of liq-

uid manure yields 2.6 pounds of struvite, a fertilizer for forage crops and nursery plants that’s light enough to economically transport. Harrison estimated 1,000 cows could produce 100 pounds of struvite a day.

“At the end of day,” Harrison said, “it would be nice if it were an income stream for dairies.”

Harrison has been working on the idea for about a dozen years, forming a long-time partnership with Keith Bowers, an engineer who invented technology to recover phosphorous in livestock and human waste and founded a Seattle company, Multiform Harvest.

Multiform’s customers include sewer plants in Yakima, Boise and Green Bay, Wis.

“It’s not something that’s

Western Innovator

Joe Harrison
Age: 60

Position: Washington State University animal science professor at the Puyallup Research Center

Education: Bachelor’s, master’s and doctorate degrees from Ohio State University

being tinkered around with,” Bowers said. “I would hope people would become aware of the struvite technology and recognize that it is a solution that’s available now.”

Bowers, who grew up on a hog farm, said the struvite-maker can remove up to about 80 percent of the phosphorous in manure. “You don’t necessarily want to take it all,” he said.

Several previous applications for funding a portable struvite-maker were rejected.

“I’m excited we finally got the money to get the wheels on the road,” Harrison said. “We both have a lot of passion for this one.”

He said he’s looking for dairies to try the system — at no cost to the farmer, except for the electricity to power the struvite-maker.

Harrison is also looking for farmers to take the resulting product.

Calendar

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Wednesday-Friday

Jan. 4-6

Potato Expo 2017. Moscone Center West, 800 Howard St. San Francisco, Calif. potato-expo.com

Friday, Jan. 6

Beef Herd Economics Workshop. 10 a.m.-3 p.m. Grant County Fairgrounds, Moses Lake, Wash. Sponsored by Washington State University Extension. Cost: Free. <http://bit.ly/2h1H4X3>

Friday-Wednesday

Jan. 6-11

2017 American Farm Bureau Federation Annual Convention & IDEAg Trade Show. Phoenix Convention Center, 100 N Third St., Phoenix, Ariz. <http://annualconvention.fb.org>

Tuesday, Jan. 10

Idaho-Eastern Oregon Alfalfa and Clover Seed School. Caldwell Elks Lodge, Caldwell, Idaho. Contact: benjamin@amgidaho.org

Thursday, Jan. 12

Irrigation Equipment Show and Conference. 8 a.m.-4:30 p.m. Burley Inn and Convention Center, 800 Overland Ave., Burley, Idaho. Classes on irrigation-related topics will be offered along with a trade show. Sponsored by the Idaho Irrigation Equipment Association. <http://bit.ly/2hWuOTw>

Inside the Family, Outside the Business. 7:30 to 9 a.m., BridgePort BrewPub, 1313 NW Marshall St., Portland. This session will explore how family members involved in the business can best communicate and collaborate with non-active members. We will share first-hand insights from a panel of non-active family members on how they have faced the challenges of being inside the family, but outside the business. Presented by the Austin Family Business Program, Oregon State University. \$40 per person. 800-859-7609 <http://bit.ly/2gQX6M4>

Thursday-Friday

Jan. 12-13

Oregon Mint Growers Annual Meeting. Salishan Lodge & Golf Resort, 7760 Hwy 101 North, Gleneden Beach, Ore. oregonmint.org

Monday, Jan. 16

Oregon Blueberry Conference. 8 a.m.-6 p.m. Salem Convention Center, 200 Commercial St. SE, Salem. Presented by the Oregon Blueberry Commission and the North Willamette Research and Extension Center. 503-589-1700 or oregonblueberry.com

Tuesday, Jan. 17

Succession Planning Workshop orientation. 9 a.m.-noon. This is the first of two workshops on succession planning. Cost includes planning workbook and food. Presenters from: OSU’s Ties to the Land, Green Belt Land Trust, Farm Credit Services and attorneys specializing in conservation and farm and ranch estate planning. Western Oregon University Werner University Center, Pacific Room, Monmouth, Ore. Cost: \$50 per family. <http://www.polkswdc.com/success.html>

Tuesday-Thursday

Jan. 17-19

38th Annual Eastern Idaho Ag Expo. Idaho State University Holt Arena, 921 South 8th Ave., Pocatello, Idaho. www.spectraproductions.com

Wednesday-Thursday

Jan. 18-19

49th Annual Idaho Potato Conference. Idaho State University’s Pond Student Union Building, 921 S. Eighth Ave., Pocatello, Idaho. Speakers include Idaho Potato Commission President and CEO Frank Muir, Potatoes USA President and CEO Blair Richardson and National Potato Council Executive Vice President John Keeling. <http://bit.ly/2fayqPE>

Idaho Noxious Weed Conference. Riverside Hotel, 2900 Chinden Blvd., Boise, Idaho. www.idahoweedcontrol.org

Wednesday-Friday

Jan. 18-20

Idaho Horticulture Expo. Boise Centre on the Grove, 850 W. Front St., Boise, Idaho. Sponsored by the Idaho Nursery and Landscape Association, this annual event offers seminars and workshops on topics important to the nursery industry. inlagrow.org

Thursday, Jan. 19

Oregon Tall Fescue Commission meeting. 6-8 p.m. Cascade Grill restaurant, 110 Opal St. NE, Albany, Ore. www.oregontallfescue.org/

Friday, Jan. 20

Family Foresters Workshop. 8:30 a.m.-5 p.m. Coeur d’Alene Inn, 506 W. Appleway Ave., Coeur d’Alene, Idaho. The program will

feature presentations on up and coming forest products, changes in Inland Northwest family forestry, managing forests in the face of droughts, effectiveness of prescribed burns in preventing fire; research updates on forest biofuels, managing family forest habitats for moose and the annual family forest economics/policy update. Register by Jan. 13. Cost: \$85-\$90. www.uidaho.edu/FamilyForesterWorkshop

Tuesday, Jan. 24

Western Idaho Ag Expo. 9 a.m.-4 p.m. Caldwell Events Center, 2207 Blaine St., Caldwell, Idaho. <http://www.spectraproductions.com>

Tuesday-Thursday

Jan. 24-26

Northwest Agricultural Show. Portland Expo Center, 2060 N. Marine Drive, Portland, Ore. The hours are 9 a.m.-6 p.m. on Tuesday, 9 a.m.-8 p.m. on Wednesday and 9 a.m.-3 p.m. on Thursday. www.nwagshow.com

Wednesday-Friday

Jan. 25-27

FSPCA Preventive Controls for Human Food Course. Idaho Department of Labor, 600 N. Thornton St., Post Falls, Idaho. The new Food Safety Modernization Act regulation requires every processing facility to have a trained resource person or “Preventive Controls Qualified Individual” who has completed a specialized training course (such as this one) developed by the Food Safety Preventive Controls Alliance that is recognized by the FDA. This person will oversee the implementation of the facility’s food safety plan and other key tasks. <http://bit.ly/2f6cogT>

Wednesday-Saturday

Jan. 25-28

American Sheep Industry Association Convention. Denver Marriott City Center, 1701 California St., Denver, Colo. www.sheepusa.org/About_Events_Convention

EcoFarm Conference. Asilomar Conference Grounds, 800 Asilomar Ave., Pacific Grove, Calif. The theme of this year’s meeting is “Cultivating Diversity.” <https://eco-farm.org/conference>

Wednesday, Feb. 1

California Prune Industry Summit. Orchard Creek Lodge, Lincoln, Calif. www.californiadriedplums.org

Tuesday, Feb. 7

Pesticide Short Course-IPM. 8 a.m.-4:10 p.m. Lane Community College, Center for Meeting and Learning, Bldg. 19, 4000 E. 30th Ave., Eugene, Ore. \$85 if registered by Jan. 23; \$95 after. <http://extension.oregonstate.edu/lane/farms>

www.oregonstate.edu/lane/farms

Alfalfa U. Learn how alfalfa can contribute to a farm’s profitability. Canyon Crest Dining and Event Center, 330 Canyon Crest Drive, Twin Falls, Idaho. alfalfaU.com

Tuesday-Thursday

Feb. 7-9

Spokane Ag Expo and Pacific Northwest Farm Forum. Spokane Convention Center, 334 W. Spokane Falls Blvd., Spokane, Wash. Spokane Ag Expo is the largest farm machinery show in the Inland Northwest. <https://greater-spokane.org/ag-expo/>

Washington Association of Wine Grape Growers 2017 Convention. 8 a.m.-5 p.m. Three Rivers Convention Center, 7016 Grandridge Blvd., Kennewick, Wash. This annual event includes the second largest industry trade show in the nation and a welcome breakfast. wawgg.org

Wednesday-Feb. 8

Oregon Clover Growers Annual Meeting. Noon-1 p.m. Holiday Inn, Wilsonville. www.oregonclover.org

Wednesday-Thursday

Feb. 8-9

8th Annual Organic Farming Conference. Canyon Crest Event Center, 330 Canyon Crest Drive, Twin Falls, Idaho. The event is organized by the Northwest Center for Alternatives to Pesticides. www.pesticide.org/events

Friday, Feb. 10

University of Idaho Cropping School. 8:30 a.m.-3 p.m. Best Western Plus Caldwell Inn & Suites, 908 Specht Ave., Caldwell, Idaho. This event will have presentations on fertilizer and irrigation water management, crop diseases, falling numbers, soil health, precision ag, unmanned aerial systems and a drone flight demonstration (weather permitting). CEUs available. The cost is \$20 and includes breakfast and lunch. owalsh@uidaho.edu, 208-722-6701

Friday-Sunday

Feb. 10-12

2017 Women’s Conference. Chico Hot Springs, 163 Chico Road, Pray, Mont. Women’s leadership, communication and other agriculture-related topics will be discussed. Sponsored by the Montana Farmers Union. montanafarmersunion.com

Tuesday-Thursday

Feb. 14-16

World Ag Expo. International Agri-Center, 4500 Laspinna St., Tulare, Calif. The nation’s largest agricultural exhibition celebrates its

50th year. www.worldagexpo.com

Practical Food Safety & HACCP. The Riverside Hotel, 2900 Chinden Blvd., Boise, Idaho. HACCP, or Hazard Analysis Critical Control Points, is a preventive system for the control of health-threatening food hazards during food processing. The comprehensive three-day workshop is designed for individuals responsible for implementing and managing a HACCP system in a food processing facility. Participants who pass a final test will receive a certificate of completion. <http://bit.ly/2f2tJ9Q>

Thursday, Feb. 16

Keeping Your Family Business Communication on Track. 7:30 to 9 a.m. Hayden’s Lakefront Grill, 8187 SW Tualatin-Sherwood Road, Tualatin, Ore. This session will provide tools and techniques that attendees can use right away to cultivate better communication among family members, employees, and shareholders. Presented by: Mark Wickman, Family Business Counsel. \$40 per person. 800-859-7609, <http://bit.ly/2fPK987>.

Wednesday, March 8

Taxes and Succession Planning. Noon-1 p.m. Join us for a free online webinar and an introduction to how planning ahead for estate and gift taxes can help address family and business needs and meet retirement goals for the current generation. Presented by: Carol Wachter and Heather Tomsick, Deloitte Tax LLP, and the Austin Family Business Program, Oregon State University. 800-859-7609, <http://bit.ly/2gW7Kjq>

Thursday, March 16

Building Family Business Value from the Inside Out. 7:30 to 9 a.m. BridgePort BrewPub, 1313 NW Marshall St., Portland. Much can be done to build the value of the business from inside the enterprise, and the earlier the process begins, the more sustainable the results will be. In addition to building value, most businesses become more efficient and profitable along the way. Presented by Francis Brown, Key Private Bank and the Austin Family Business Program, Oregon State University. 800-859-7609, <http://bit.ly/2gR3KCO>

Tuesday, April 11

Do Your Kids Want the Business? Planning for Yes or No. 7:30 to 9 a.m. Hayden’s Lakefront Grill, 8187 SW Tualatin-Sherwood Road, Tualatin, Ore. This session will deliver practical advice for family business owners regarding next generation succession. Presented by Steve Bennett, Farleigh Wada Witt and the Austin Family Business Program, Oregon State University. 800-859-7609, <http://bit.ly/2h3k8Ck>

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